3GPP TSG-CN Meeting #24 **NP-040166**
2nd – 4th June 2004. Seoul, Korea.

Title:	**LS on Assignment of the Diameter codes and identifiers**
Source:	**CN4**
Agenda item:	**5.1**
Document for:	**INFORMATION**

3GPP TSG CN WG4 Meeting #22bis ***N4-040466***
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To: CN3, SA5
Cc: CN, SA

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Attachments: N4-040465 [Draft TS 29.230 v0.3.0]

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1. Overall Description:

As agreed by the CN#23, the CN4 has the responsibility to coordinate the 3GPP specific Diameter codes and identifiers. The CN4 has created a draft of the TS 29.230, which documents those codes and identifiers, to be the basis of the coordination. The annex A of the TS contains the recommended rules for the assignment procedure of different Diameter codes and identifiers.

2. Actions:

To CN3 and SA5 groups.

ACTION: CN4 kindly asks the other working groups to review the attached draft TS 29.230 and provide input to CN4 on any existing deficiencies. Special attention should be paid on the annex A, which describes the recommended assignment procedure of any new Diameter codes and identifiers within the 3GPP.

3. Date of Next CN4 Meeting:

CN4 #23	10th – 14th May 2004	Zagreb, CROATIA
CN4 #24	16th – 20th August 2004	Sophia Antipolis, FRANCE

3GPP TS 29.230 V0.3.0 (2004-04)

Technical Specification

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document lists the 3GPP specific Diameter protocol codes, including the AVP codes and Experimental result codes.

This document lists also the application identifiers assigned to 3GPP specific Diameter applications by IANA and the Diameter command code range which is assigned to 3GPP by IANA.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 29.228: " IP Multimedia (IM) Subsystem Cx and Dx interfaces; Signalling flows and message contents"

[2] 3GPP TS 29.229: " Cx and Dx interfaces based on the Diameter protocol; Protocol details"

[3] 3GPP TS 29.328: " IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents"

[4] 3GPP TS 29.329: " Sh Interface based on the Diameter protocol; Protocol details"

[5] 3GPP TS 32.225: " Telecommunication management; Charging management; Charging data description for the IP Multimedia Subsystem (IMS)"

[6] 3GPP TS 29.234: "3GPP System to WLAN Interworking; Stage 3 Description"

[7] 3GPP TS 29.109: " Generic Authentication Architecture (GAA); Zh and Zn Interfaces based on the Diameter protocol; Protocol details "

[8] 3GPP TS 29.209: " Technical Specification Group Core Network; Policy control over Gq interface"

[9] IETF RFC 3588: "Diameter Base Protocol"

[10] IETF RFC 3589: "Diameter Command Codes for Third Generation Partnership Project (3GPP) Release 5"

[11] IANA’s Enterprise-Numbers: http://www.iana.org/assignments/enterprise-numbers

[12] IANA’s AAA parameters register: ftp://ftp.iana.org/assignments/aaa-parameters/

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

3GPP specific: A definition which is used in conjunction with the 3GPP's vendor identifier.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AVP Attribute-Value-Pair
IANA Internet Assigned Numbers Authority

4 Application identifiers

The Diameter applications are identified with the application identifiers as specified in the RFC 3588 [9]. There are two kind of applications: IETF standards track applications and vendor specific applications. All application identifiers are assigned by IANA [12]. This chapter lists the application identifiers asigned by IANA to all 3GPP Diameter applications.

The application identifiers are transferred in Diameter command's header in the Application-ID field.

4.1 3GPP specific application identifiers

The 3GPP specific application identifiers allocated by IANA are listed in the following table.

Table 4.1: 3GPP specific application identifiers

Application identifier	Application	3GPP TS
167772151	3GPP Cx/Px	29.228 [1] and 29.229 [2]
167772152	3GPP Sh/Ph	29.328 [3] and 29.329 [4]
167772153	3GPP Rf/Ro	32.225 [5]

Editors note: The following applications are under development and they don't have the application id yet.

	3GPP Wx	29.234 [6]
	3GPP Zn	29.109 [7]
	3GPP Zh	29.109 [7]
	3GPP Gq	29.209 [8]

5 Command codes

The command codes are used for communicating the command associated with the Diameter message. The command code is carried in the Diameter header's Command-Code field. The command codes can be divided into standard command codes allocated by IANA and experimental command codes for testing purposes only.

5.1 Command codes allocated for 3GPP

Based on the IETF RFC 3589 [10] the IANA has allocated a standard command code range 300-313 for 3GPP. The command codes are presented in the following table.

Table 5.1: Command codes allocated for 3GPP

Command code	Command name	Abbreviation	Specified in the TS
300	User-Authorization-Request/-Answer	UAR/UAA	29.229 [2]
301	Server-Assignment-Request/-Answer	SAR/SAA	
302	Location-Info-Request/-Answer	LIR/LIA	
303	Multimedia-Auth-Request/-Answer	MAR/MAA	
304	Registration-Termination-Request/-Answer	RTR/RTA	
305	Push-Profile-Request/-Answer	PPR/PPA	
306	User-Data-Request/-Answer	UDR/UDA	29.329 [4]
307	Profile-Update-Request/-Answer	PUR/PUA	
308	Subscribe-Notifications-Request/-Answer	SNR/SNA	
309	Push-Notification-Request/-Answer	PNR/PNA	

Editors note: The following command codes have been allocated to 3GPP, but they haven't been used yet..

310			
311			
312			
313			

6 Vendor identifier

The vendor identifier (a.k.a Enterprise number) indicates the vendor specific attributes, result codes and application identifiers in Diameter commands. The vendor identifier is used in the Vendor-ID field of the AVP header and in the Vendor-Id AVP. The Vendor-Id AVP is used to identify the vendor in the Vendor-Specific-Application-Id and Experimental-Result-Code grouped AVPs.

6.1 3GPP's vendor identifier

The IANA has allocated a vendor identifier value 10415 for 3GPP [11].

7 Attribute-Value-Pair codes

The AVP codes are used together with the vendor identifier to identify each attribute uniquely. There are multiple AVP namespaces. The IETF IANA namespace, that is, the AVPs with vendor identifier zero or without vendor identifier, is controlled by IANA. Each vendor controls the AVP codes within their AVP namespaces.

7.1 3GPP specific AVP codes

The 3GPP specific AVPs have the Vendor-Specific bit ('V' bit) set in the AVP header and they carry the 3GPP's vendor identifier in the Vendor-ID field of the AVP header. The 3GPP specific AVP codes are presented in the following table.

Table 7.1: 3GPP specific AVP codes

AVP Code	Attribute Name	Data Type	Specified in the TS
1	Visited-Network-Identifier	OctetString	29.229 [2]
2	Public-Identity	UTF8String	
3	Server-Name	UTF8String	
4	Server-Capabilities	Grouped	
5	Mandatory-Capability	Unsigned32	
6	Optional-Capability	Unsigned32	
7	User-Data	OctetString	
8	SIP-Number-Auth-Items	Unsigned32	
9	SIP-Authentication-Scheme	UTF8String	
10	SIP-Authenticate	OctetString	
11	SIP-Authorization	OctetString	
12	SIP-Authentication-Context	OctetString	
13	SIP-Auth-Data-Item	Grouped	
14	SIP-Item-Number	Unsigned32	
15	Server-Assignment-Type	Enumerated	
16	Deregistration-Reason	Grouped	
17	Reason-Code	Enumerated	
18	Reason-Info	UTF8String	
19	Charging-Information	Grouped	
20	Primary-Event-Charging-Function-Name	DiameterURI	
21	Secondary-Event-Charging-Function-Name	DiameterURI	
22	Primary-Charging-Collection-Function-Name	DiameterURI	
23	Secondary-Charging-Collection-Function-Name	DiameterURI	
24	User-Authorization-Type	Enumerated	
25	User-Data-Request-Type	Enumerated	
26	User-Data-Already-Available	Enumerated	
27	Confidentiality-Key	OctetString	
28	Integrity-Key	OctetString	
Note: The AVP codes from 29 to 99 are reserved for TS 29.229.			
100	User-Identity	Grouped	29.329 [4]
101	MSISDN	OctetString	
102	User-Data	OctetString	
103	Data-Reference	Enumerated	
104	Service-Indication	OctetString	
105	Subs-Req-Type	Enumerated	
106	Requested-Domain	Enumerated	
107	Current-Location	Enumerated	
108	Identity-Set	Enumerated	
Note: The AVP codes from 109 to199 are reserved for TS 29.329.			

8 Experimental result codes

The Diameter answer messages must carry either Result-Code AVP or Experimental-Result AVP. The values of Result-Code AVP are controlled by IANA. The Experimental-Result AVP is a grouped AVP containing the Vendor-Id AVP and Experimental-Result-Code AVP, thus the experimental result codes are controlled in a vendor-specific manner.

8.1 3GPP specific result codes

The 3GPP specific result codes are always transferred in the Experimental-Result AVP, which has the Vendor-Id with value of 3GPP's vendor identifier. The 3GPP specific result codes shall follow the same classification as defined for the values of Result-Code AVP in IETF RFC 3588 [9]. That means, the result codes are grouped to following ranges:

- 1xxx (Informational)
- 2xxx (Success)
- 4xxx (Transient Failures)

- 5xxx (Permanent Failures)

8.1.1 Informational

The Informational result codes shall use the values from 1001 to 1999 in the Experimental-Result-Code AVP.

Editor's note: No informational result codes have been yet defined in 3GPP.

8.1.2 Success

The Success result codes shall use the values from 2001 to 2999 in the Experimental-Result-Code AVP. The reserved 3GPP specific Success result codes are presented in the following table.

Table 8.1.2: 3GPP specific Success result codes

Experimental Result Code	Result text	Specified in the TS
2001	DIAMETER_FIRST_REGISTRATION	29.229 [2]
2002	DIAMETER_SUBSEQUENT_REGISTRATION	
2003	DIAMETER_UNREGISTERED_SERVICE	
2004	DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED	
2005	DIAMETER_SERVER_SELECTION	
Note: The Experimental Result Codes from 2006 to 2020 are reserved for the TS 29.229.		

8.1.3 Transient Failures

The Transient Failure result codes shall use the values from 4001 to 4999 in the Experimental-Result-Code AVP. The reserved 3GPP specific Transient Failure result codes are presented in the following table.

Table 8.1.3: 3GPP specific Transient Failure result codes

Experimental Result Code	Result text	Specified in the TS
4100	DIAMETER_USER_DATA_NOT_AVAILABLE	29.329 [4]
4101	DIAMETER_PRIOR_UPDATE_IN_PROGRESS	
Note: The Experimental Result Codes from 4102 to 4120 are reserved for the TS 29.329.		

8.1.4 Permanent Failures

The Permanent Failure result codes shall use the values from 5001 to 5999 in the Experimental-Result-Code AVP. The reserved 3GPP specific Permanent Failure result codes are presented in the following table.

Table 8.1.4: 3GPP specific Permanent Failure result codes

Experimental Result Code	Result text	Specified in the TS
5001	DIAMETER_ERROR_USER_UNKNOWN	29.229 [2]
5002	DIAMETER_ERROR_IDENTITIES_DONT_MATCH	
5003	DIAMETER_ERROR_IDENTITY_NOT_REGISTERED	
5004	DIAMETER_ERROR_ROAMING_NOT_ALLOWED	
5005	DIAMETER_ERROR_IDENTITY_ALREADY_REGISTERED	
5006	DIAMETER_ERROR_AUTH_SCHEME_NOT_SUPPORTED	
5007	DIAMETER_ERROR_IN_ASSIGNMENT_TYPE	
5008	DIAMETER_ERROR_TOO_MUCH_DATA	
5009	DIAMETER_ERROR_NOT_SUPPORTED_USER_DATA	
5010	DIAMETER_MISSING_USER_ID	
Note: The Experimental Result Codes from 5011 to 5020 are reserved for the TS 29.229.		
5100	DIAMETER_ERROR_USER_DATA_NOT_RECOGNIZED	29.329 [4]
5101	DIAMETER_ERROR_OPERATION_NOT_ALLOWED	
5102	DIAMETER_ERROR_USER_DATA_CANNOT_BE_READ	
5103	DIAMETER_ERROR_USER_DATA_CANNOT_BE_MODIFIED	
5104	DIAMETER_ERROR_USER_DATA_CANNOT_BE_NOTIFIED	
5105	DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC	
Note: The Experimental Result Codes from 5106 to 5120 are reserved for the TS 29.329.		

Annex A (informative): Assignment of the Diameter codes and identifiers in 3GPP

This annex defines the recommended assignment procedure of Diameter codes and identifiers within the 3GPP.

A.1 Application identifiers

If a working group detects it will require a new application identifier, it should contact the 3GPP TSG-CN WG 4 via a Liaison Statement. The LS shall contain the name of the Diameter application and a reference to the corresponding 3GPP TS. The 3GPP TSG-CN WG 4 will then request the application identifier from IANA. When the application identifier will be received, the corresponding working group will be informed by 3GPP TSG-CN WG 4 and the table 4.1 in this specification will be updated.

According to RFC 3588 the creation of a new application should be avoided if at all possible and therefore it is recommended to use the existing application identifiers whenever possible.

A.2 Command codes

If a working group detects there is a need for a new command code(s) from the 3GPP's range, it should contact the 3GPP TSG-CN WG 4 via an LS. The LS shall contain the reference to the 3GPP TS, which specifies the command(s). The 3GPP TSG-CN WG 4 will inform the assigned command code(s) to the corresponding working group and the table 5.1 in this specification will be updated.

It should be noted that the standard command codes allocated for 3GPP are scarce resource and getting new ones would require IETF specification work to be done. Therefore it is recommended to use the existing command codes whenever possible.

A.3 AVP codes

If a working group detects a Diameter application needs new 3GPP specific AVP codes, it should contact the 3GPP TSG-CN WG 4 via an LS. The LS shall contain the name of the Diameter application and a reference to the corresponding 3GPP TS. The 3GPP TSG-CN WG 4 will allocate a range of 100 AVP codes for the application. The range will be informed to the corresponding working group and the table 7.1 will be updated in this specification to show the reserved range. The working group can use the allocated range as a working assumption when defining the actual AVPs.

When the corresponding working group has specified the AVPs, it should inform them to the 3GPP TSG-CN WG 4 via an LS. The LS should list the used AVP codes in the form of the table 7.1.

If there will be defined new AVPs for a Diameter application through the CR procedure, the assigned AVP range can be used, but the 3GPP TSG-CN WG 4 should be also informed about the new AVP codes via an LS.

Re-using of the existing AVPs is recommended, but special attention should be paid on the use of enumerated AVPs. Defining new values for an enumerated AVP should be agreed case by case with the working group responsible of the particular enumerated AVP. 3GPP TSG-CN WG 4 shall be informed via an LS about the new values assigned to the enumerated AVP.

A.4 Result codes

If a working group detects a Diameter application needs new 3GPP specific result codes, it should contact the 3GPP TSG-CN WG 4 via an LS. The LS shall contain the name of the Diameter application and a reference to the corresponding 3GPP TS. The 3GPP TSG-CN WG 4 will allocate a range of 20 result codes from each required result code group for the application. The ranges will be informed to the corresponding working group and the tables in the chapter 8 of this specification will be updated to show the reserved ranges. The working group can use the allocated ranges as a working assumption when defining the actual result codes.

When the corresponding working group has specified the result codes, it should inform them to the 3GPP TSG-CN WG 4 via an LS. The LS should list the used result codes in the form of the tables in chapter 8.

If there will be defined new result codes for a Diameter application through the CR procedure, the assigned result code ranges can be used, but the 3GPP TSG-CN WG 4 should be also informed about the new result codes via an LS.

Re-using of the existing result codes is recommended.

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2004-04					First draft to be presented in CN4#22bis	0.0.0	0.1.0
2004-04					Informative annex added to describe the assignment procedure	0.1.0	0.2.0
2004-04					Annex A improved	0.2.0	0.3.0